

## Patent claims

1. A computer-aided selection method for a part of a volume,
  - 5 - wherein a computer (1) evaluates only the selected part which, in particular, is displayed via an output medium (4)
  - wherein the part is in the form of a polyhedron with polyhedron surfaces (A1 - A14)
  - 10 - wherein each polyhedron surface (A1 - A14) is bounded by polyhedron edges (L1 - L23), and
  - wherein each polyhedron edge (L1 - L23) is bounded by polyhedron corners (E1 - E10, E4') and bounds two, and only two, polyhedron surfaces (A1 - A14),
  - 15 characterized
  - in that the polyhedron corners (E1 - E10, E4') are predetermined for the computer (1) in order to determine the selected part, and
  - in that the polyhedron edges (L1 - L23) and
  - 20 polyhedron surfaces (A1 - A14) are determined automatically by the computer (1) on the basis of the predetermined polyhedron corners (E1 - E10, E4').
- 25 2. The selection method as claimed in claim 1, characterized  
in that a user (9) - preferably interactively - predetermines repositioning for one of the polyhedron corners (E4) for the computer (1), and in that the
- 30 computer (1) then redetermines those polyhedron edges (L6, L11, L12) and polyhedron surfaces (A2 - A4) which contain the repositioned polyhedron corner (E4') in order to determine the selected part.
- 35 3. The selection method as claimed in claim 2, characterized

in that at least one of the polyhedron surfaces (for  
example A3) which contain the polyhedron corner (E4) to  
be repositioned is in the form of a polygon with more  
5 than three polyhedron corners (E1 - E4), and

- in that this polyhedron surface (A3) is replaced by the computer (1) by polyhedron surfaces (A7, A8) which are in the form of triangles and each contain one polyhedron edge (L4, L5) which is not  
5 bounded by the polyhedron corner (E4) to be repositioned of the polygon (A3) as well as the repositioned polyhedron corner (E4').

4. The selection method as claimed in claim 2,  
10 characterized

- in that at least one of the polyhedron surfaces (for example A3) which contain the polyhedron corner (E4) to be repositioned is a polygon with more than three polyhedron corners (E1-E4), and
- 15 - in that this polyhedron surface (A3) is replaced by the computer (1) by two polyhedron surfaces (A9, A10), wherein one is defined by the polyhedron corners (E1 - E3) of the polygon (A3) which are not to be repositioned, and the other is  
20 defined by those polyhedron corners (E1, E3) of the polygon (A3) which are immediately adjacent to the polyhedron corner (E4) to be repositioned, and by the repositioned polyhedron corner (E4').

25 5. The selection method as claimed in claim 3 or 4, characterized  
in that the method as claimed in claim 3 and/or 4 is carried out only when a vector (V) from the polyhedron corner (E4) to be repositioned to the repositioned  
30 polyhedron corner (E4') forms an angle other than zero with the polygon (A3).

6. The selection method as claimed in one of claims 2 to 5,  
35 characterized  
in that the repositioning of the polyhedron corner (E4)

is predetermined for the computer (1) by the user (9) shifting the polyhedron corner (E4) along a straight line (10) which is defined before the repositioning of the polyhedron corner (E4).

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7. The selection method as claimed in claim 6, characterized

in that the polyhedron corner (E4) to be repositioned is selected by the user (9) before the repositioning, and in that the straight line (10) is automatically determined by the computer (1) on the basis of the  
5 selected polyhedron corner (E4).

8. The selection method as claimed in claim 6, characterized  
in that the straight line (10) is predetermined for the  
10 computer (1) by the user (9) before the repositioning of the polyhedron corner (E4).

9. The selection method as claimed in one of claims 2 to 7,  
15 characterized  
in that a new polyhedron corner (E9, E10) is additionally predetermined for the computer (1) by the user (9) - preferably interactively.

20 10. The selection method as claimed in claim 9, characterized in that the new polyhedron corner (E9, E10) is predetermined by selection of a polyhedron edge (for example L1) or of a polyhedron surface (for example A2), and by subsequently placing the new  
25 polyhedron corner (E9, E10) within the selected polyhedron edge (L1) or polyhedron surface (A2).

11. The selection method as claimed in one of claims 2 to 10,  
30 characterized  
in that an unnecessary polyhedron corner (E9, E10) is deleted by the user (9) - preferably interactively.

12. The selection method as claimed in claim 11,  
35 characterized  
in that the deletion of the unnecessary polyhedron

corner (E9, E10) by the computer (1) is permitted only when the unnecessary polyhedron corner (E9, E10) is a common polyhedron corner (E9, E10) of at least two mutually adjacent polyhedron surfaces (for example  
5 A11 - A14) which lie on a common plane.

13. The selection method as claimed in one of claims 2 to 12,

characterized

- 5 - in that at least one of the polyhedron surfaces (for example A6) which contain the polyhedron corner (E4) to be repositioned is a polygon with more than three polyhedron corners (E5 - E8), and
- 10 - in that the user (9) - preferably interactively - inserts an additional polyhedron edge (L23) which is bounded by two polyhedron corners (for example (E5, E7), which were previously not immediately adjacent, of the polygon (A6).

14. The selection method as claimed in one of claims 2 to 13,

characterized

in that an unnecessary polyhedron edge (for example L18) is deleted by the user (9) - preferably interactively.

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15. The selection method as claimed in claim 14, characterized

- 25 in that the deletion of the unnecessary polyhedron edge (L18) by the computer (1) is permitted only when the polyhedron surfaces (for example A12, A13) which are adjacent to the unnecessary polyhedron edge (L18) lie on a common plane.

30 16. A storage medium in which machine-legible digital control signals (7) are stored, which interact with a computer (1) in such a way that, when they are executed by the computer (1) they result in a selection method as claimed in one of claims 1 to 15.

35 17. A computer program product having machine-legible digital program code (7) which is stored in a data

storage medium (8), for carrying out a selection method as claimed in one of claims 1 to 15 when the program code (7) is executed by a computer (1).

- 5 18. A computer program with digital program code (7) for carrying out a selection method as claimed in one of



claims 1 to 15 when the program code (7) is executed by a computer (1).

19. A computer which is programmed to carry out a  
5 selection method as claimed in one of claims 1 to 15.